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REQUESTED BY DUKE ENERGY CAROLINAS - SMART GRID ACTIVITY

**TRANSCRIPT OF
PROCEEDINGS**

VOLUME 1

COMMISSIONERS PRESENT: G. O'Neal HAMILTON, *CHAIRMAN*, C. Robert MOSELEY, *VICE CHAIRMAN*; and COMMISSIONERS John E. "Butch" HOWARD, Elizabeth B. "Lib" FLEMING, and Randy MITCHELL.

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Protecting the environment by lowering energy use: Jenna's presentation to her class is about how the utility company can help her family understand how her family uses energy and helps them to use it more effectively. Jenna and her dad access the utility's website to see their real-time usage information. By better understanding how they are using energy, they are able to make better choices about when and how they use energy in order to reduce their consumption. This family significantly reduced their energy use and environmental footprint by installing a smart thermostat, more efficient lighting, and smart appliances.

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Managing energy usage through a budget: Joshua's presentation to his class is about his grandmother who is on a fixed income. His grandmother has chosen to participate in a utility program that, using smart metering technology, can help her manage her energy consumption to a specific budgeted amount each month. Through real-time information, the grandmother can see things like how much energy she has used already, how many units, and what appliances are using the cost energy. During a heat wave, the utility proactively contacts her to let her know that at the present usage rate, she will exceed her budgeted amount. The grandmother gets to choose between having the utility manage her usage in order to stay on budget or she may choose to spend a little more and stay comfortable through the heat wave. Smart grid technology can allow customers to proactively manage their energy use to a budget, without giving up the option to stay comfortable.

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Storm outage restoration: Maria's presentation is on a recent storm that caused outages in her neighborhood. The smart grid allowed the utility to pinpoint the location of the outage and more accurately dispatch workers to the cause of the outage. The utility was also able to reroute electricity around the damage so fewer customers were without power. Further, the utility was able to more accurately predict when the power would be back on and proactively contact customers about restoration times.	
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P R O C E E D I N G S

CHAIRMAN HAMILTON: Please be seated. We'll call the briefing to order. We've got a very smart group today. I tell you what, you are very impressive. Welcome. Catherine, I'll turn it over to you and let you educate us.

MS. HEIGEL: All right, thank you. Good morning, Mr. Chairman, Commissioners. My name is Catherine Heigel. I'm here on behalf of Duke Energy Carolinas and am happy to see you all again.

We are excited to be here this morning to talk to you all about what we think are very exciting developments in technology that will help to revolutionize our business and the way we deliver it.

Let me introduce, before I get too far, the panel that we have here today for Duke. We have Ms. Diane Denton, who is a director in our regulatory strategy group; Mr. Rob Manning, who is vice president of field operations; Matt Smith, who's the director of technology development; and Carol Shrum, who is our vice president of rates.

Before we get into the presentation, we have two aspects of the presentation this morning. We have a PowerPoint, and we have some video clips we

1 would like to show you all.

2 We have, as you know, a pending docket on
3 energy efficiency, so we would ask your
4 understanding that there may be certain questions
5 that we might not be able to answer as it relates
6 to a specific energy efficiency program, as a
7 result of that pending docket. And I also wanted
8 to make clear that we are not here for any request.
9 This is purely informational, to let you know what
10 we are doing and looking at and evaluating, and
11 some of the things that we're finding to be very
12 exciting in the industry. And we know that you all
13 hear about these things at NARUC and other places,
14 and we'd like you to know that one of your
15 utilities is evaluating these options.

16 As we go through the presentation, we
17 certainly welcome your questions and would hope
18 that you would feel free to ask them, and of
19 course, at the end we'll also have an opportunity
20 for questions, as well.

21 So with that, we'll go ahead and get started,
22 and Ms. Diane Denton will kick it off, as soon as I
23 give her the clicker [indicating].

24 **MS. DENTON:** [Indicating.]

25 **CHAIRMAN HAMILTON:** Lessie, we don't want to

1 leave you out. Happy to have you, Ms. Hammonds,
2 with us this morning.

3 **MS. HAMMONDS:** Thank you, Mr. Chairman.
4 Lessie Hammonds, here today, as Executive Director
5 Dukes Scott's designee for ORS.

6 **CHAIRMAN HAMILTON:** Thank you, very much, for
7 being with us.

8 **MS. HAMMONDS:** Thank you.

9 **MS. DENTON:** Good morning, Mr. Chairman and
10 Commissioners. I appreciate the opportunity to
11 come and talk with you today about smart grids.

12 As Catherine mentioned, what we want to talk
13 to you about today is just to provide an
14 educational overview on smart grid activity in the
15 United States. We want to talk about what we
16 believe are the benefits of implementing a smart
17 grid, what Duke Energy is doing around smart grid
18 and new technologies. We want to bring that to
19 South Carolina and talk about what we've been doing
20 specifically in this State. And then, as Catherine
21 mentioned, we'll wrap up with just a few video
22 clips that are illustrative of kind of the smart
23 grid vision and the possibilities that we think are
24 coming in the near future.

25 And as Catherine mentioned, please just stop

me and let's answer questions as we go.

Let me start by just touching on new federal legislation, the Energy Independence And Security Act of 2007. This was legislation signed into law by President Bush December 19, 2007, and it really has several key areas of focus. It is quite broad, but if I were to summarize and tell you kind of what the key buckets are, in terms of the legislation, it focuses on energy security for the United States, and really in terms of making us a more energy-secure country it focuses on things like vehicle fuel economy, the production -- increasing the production of bio-fuels. It focuses a lot on how do we save energy as a company [sic] through appliance standards, building and industry standards. It touches on carbon capture and sequestration, and it also focuses on smart grids.

And there are many definitions of smart grids. I imagine, if you even asked each one of us here at the table, we might define it a little differently. But, I thought we might start by just the definition that's offered in this new legislation, which is really referring to a distribution system that allows for two-way communication. You'll hear that a lot as you hear about smart grids or smart

1 metering technology, but what we're talking about
2 is the flow of information in two directions, both
3 to and from the customer's home. And really, as we
4 talk about smart grids, we even talk about inside
5 the customer's house, being able to gather
6 information from things like thermostats,
7 appliances, other devices, and then giving that
8 information back to the utility.

9 It includes a variety of other operational and
10 energy measures. Rob Manning will be getting into
11 details around that, but we're not just here
12 talking about smart meters, and I think that's an
13 important point to capture.

14 Key aspects of this legislation that we just
15 wanted to bring to your attention: First, we did
16 provide you with a handout of Title XIII, which is
17 the section of this legislation that deals with
18 smart grids. It's not very long, so you have a
19 summary of that in front of you, just for your
20 information. And a couple of the sections within
21 the smart grid that I just wanted to bring to your
22 attention are listed here on this slide.

23 The first is that, you know, the Department of
24 Energy is going to report to Congress on the
25 deployment of technologies and any barriers to

1 deployment. There's going to be several study
2 commissions formed to talk about, you know, how do
3 we get this implemented, you know, how do we make
4 sure that this is something that we can pursue as a
5 country. And then there's also a section that
6 looks at a federal fund that would match one-fifth
7 of the smart grid investments made by nonfederal
8 entities. This is, of course, of interest to Duke
9 Energy, as we look at smart grid technologies and,
10 certainly while this is yet to be funded, we
11 certainly will keep our eyes open to see if there
12 are, one day, federal funds available for us to
13 pursue.

14 And then under Section 1307 of Title XIII is
15 regarding rate recovery, where the legislation just
16 encourages the states to consider authorizing
17 utilities to recover the costs related to the
18 deployment of a smart grid system. And, obviously,
19 we find that of interest, as well.

20 As I move on to the next slide, this is really
21 just an illustration to show that, you know, Duke
22 Energy is not out in front on this. We certainly
23 think we're out in front in the way we're looking
24 at smart grid technologies, the way we're looking
25 to maintain flexibility and having a long-term

1 vision around smart grid technologies, but this
2 certainly isn't something brand new in our country.

3 You can see from the map that many utilities
4 are starting to implement smart grid technologies.
5 You can see penetration rates there in the bottom
6 right-hand corner where the orange is over 40
7 percent, the green is over 10 percent, and with
8 yellow over 4 percent penetration there, in terms
9 of where you're starting to see this technology
10 deployed.

11 **COMMISSIONER HOWARD:** Ms. Denton.

12 **MS. DENTON:** Yes.

13 **COMMISSIONER HOWARD:** I have a question on the
14 previous slide.

15 **MS. DENTON:** Yes, sir.

16 **COMMISSIONER HOWARD:** The last point, it
17 states that the recovery in a timely manner of
18 remaining book-value cost of any equipment rendered
19 obsolete by the deployment of the smart grid
20 system. Is that something you all will discuss
21 later, or what makes up some of that equipment that
22 might be considered obsolete by the smart grid
23 deployment?

24 **MS. DENTON:** Well, for example -- and I'll
25 certainly maybe defer that to Rob, but this might

1 include things like your existing meters today.
2 You know, if you're going to put in smarter meters
3 and smarter technology, you might have an existing
4 meter today that's not fully depreciated that you
5 would be looking to recover.

6 **MR. MANNING:** I think that that's -- that
7 would be the primary target for this. A lot of the
8 rest of the equipment I think that would be
9 considered obsolete has probably been out there
10 long enough to recover its value, but the meters --
11 in a lot of cases, states and companies have moved
12 towards automatic metering systems that were maybe
13 first technology, and this is extended technology
14 well beyond that, and while they may not be fully
15 depreciated, the value that comes from the new
16 meters surpasses the cost of letting those go
17 early. And we will talk more about that.

18 **COMMISSIONER HOWARD:** Okay, thank you.

19 **MS. DENTON:** Any questions on this slide,
20 before I move on?

21 [No response]

22 **MS. DENTON:** Okay, I'll turn it over to Rob.

23 **MR. MANNING:** Thanks, Diane. And I have the
24 opportunity to talk about what's good about smart
25 grid. It's my job to keep the lights on in the

1 Carolinas, and there are a lot of challenges to
2 keeping the lights on in the Carolinas, as you
3 certainly well know through the years. And this
4 offers an opportunity to do it in a better way.
5 And it's the first real step change that I've seen
6 in 15 or 20 years, regarding how we might can
7 deliver service to the customers of the Carolinas
8 in a better way, not only offering them more choice
9 -- as you see from the first bullet up there, there
10 are a lot of opportunities to give customers
11 choice, that we are unable to provide today because
12 we don't have the technology and we don't have the
13 ready, available information at hand. We can begin
14 to offer those customers choice through some of the
15 technologies that are out there.

16 We believe there's an opportunity to reduce
17 outages, and certainly we know there's an
18 opportunity to reduce outage duration -- and I'll
19 talk a little more about that -- and those things
20 have historically led to improved customer
21 satisfaction, and we would expect that to be the
22 case today, as well.

23 It does provide benefit to the company. There
24 are significant opportunities to gain operational
25 efficiencies. More information means we can

1 operate our system in different ways than we
2 operate our system today, and we can create some
3 opportunities that give us better efficiency
4 through automation. there are system performance
5 issues about when and how we control our system
6 through that improved information that really
7 provides benefits to us as a company. And, of
8 course, it provides benefit to communities, because
9 -- and we'll talk some more about this -- we
10 believe there's an opportunity to reduce the need
11 for generation, associated with this, which
12 improves our footprint overall, as far as carbon.
13 Integrating renewables is something we'll talk more
14 about. The integration of renewables is a brand
15 new technology and something that I believe is
16 about to explode, and we are ready to take that
17 step. But we need some significant improvements in
18 technology to effectively do that. And certainly,
19 we believe it improves public safety and employee
20 safety, as well.

21 Just to get into a little more detail, we've
22 actually been evaluating a number of components of
23 the smart grid technology for some time now. Most
24 of that equipment has been distribution automation
25 type equipment, and that has a lot to do with

1 relays, the movement of old relay technology --
2 which is akin to the old tube market and the old
3 electromechanical relays, replacing those with
4 digital equipment. And it's that digital equipment
5 that allows you to make that step change in
6 information that's available. And really, the
7 smart grid is all about access to greater
8 information, and it requires -- for example, it
9 requires broadband communication. You really can't
10 transmit the level of data that you need to
11 transmit, without some sort of broadband
12 capability. So it's more than just putting new
13 stuff on the line; it's also creating an
14 opportunity to talk to that stuff that's out there,
15 and to talk with it two-way, so that you can make
16 decisions about what's actually happening in real-
17 time ways.

18 And we're moving down that road, but it is
19 taking some time -- and I'll talk about this slide,
20 some, to just give you an example of how this
21 works, and this slide is really about meter reading
22 and metering.

23 This is an area where there are dramatic and
24 fast changes. We moved to automated meter reading,
25 which is that second step there -- oh, gosh, we

1 started that in '98, and we completed that in the
2 early 2000s, 2000-2001 I believe, in the South
3 Carolina. And we have automatic meter reading
4 today.

5 Automatic meter reading looks like a device
6 that communicates via radio. We drive by it in a
7 van, and we can drive through a neighborhood and it
8 instantly accumulates all the readings in that
9 neighborhood. And we've had that for, what, eight
10 years or so, now. It's a wonderful technology, a
11 significant improvement over having a person
12 actually having to walk out, read that meter.
13 About one out of ten gets bitten by a dog, and, you
14 know, you have all those issues that you have to
15 deal with. And now we just ride through in a van.
16 And, in fact, we found in some of the areas with
17 higher duration, you can catch mountaintop to
18 mountaintop, so you don't even have to be in the
19 neighborhood to catch some of the meters.

20 It's a good technology, but it's one-way
21 technology. It doesn't tell us anything about
22 what's going on at that particular home site. We
23 don't know anything other than the kilowatt-hour
24 usage at that site through this meter.

25 The next box that you see there is advanced

1 metering infrastructural, or AMI. And AMI has been
2 around for a number of years. It's becoming more
3 and more prolific, in this day and time, and when
4 you look back at the slide that had the states and
5 the percentage of deployment of those technologies,
6 a lot of that deployment is being deployed through
7 AMI.

8 AMI offers two-way communication. It gives
9 you the opportunity to query that meter from a
10 central location and find out some information
11 about what's going on there. The information in
12 AMI is relatively limited, though. You cannot find
13 out, for example, what's happening inside the house
14 through an AMI meter. You can only discover
15 whether or not the power is on, and whether or not
16 they're using energy at the time and what that
17 energy usage is. So, AMI has some limitations, but
18 it is a step change over AMR, which is where we are
19 today.

20 We are actually looking at skipping the AMI
21 step and moving to what is an emerging technology,
22 and we're calling that "smart meters," which is
23 kind of the industry name for the newest iteration
24 of meters. And we're looking at moving straight
25 into a smart meter platform, and you can see the

1 type of information provided with a smart meter far
2 exceeds the type of information provided by either
3 AMR or AMI.

4 We can begin to see exactly what's going on in
5 the home, and that provides that platform from
6 where you can reach out into the house and actually
7 help control things, or where you can reach out
8 into the house and provide the customer with
9 information they need to control things. It gives
10 us the opportunity to communicate on a real-time
11 basis and do things like remote disconnect, remote
12 connect. Those are the kinds of things that we're
13 not able to do today, at all. It gives us
14 information about voltage and load at that site, so
15 that if we are concerned about a low-voltage issue,
16 we might could send a query out and spot a smart
17 meter and find out what's actually going on at that
18 site, and then we can respond appropriately based
19 on that information.

20 It provides us with opportunity to know
21 whether or not there is power at that site. That
22 is something that we do not have today. Today we
23 expect a customer to call us when the power is off,
24 even with automated meter reading. A smart meter
25 gives us that opportunity to have that

1 automatically done through a smart meter, such that
2 we will know the instant that any power is off.
3 And the applications for that, I think, are
4 tremendous. It allows us to move much faster on
5 outages. We don't have to wait for the logic of
6 multiple customer calls to roll in and tell us
7 where problems are occurring. And I'll talk a
8 little more about that when we talk about outages.

9 But also, for example, think about: You're a
10 turkey farmer and your houses are remote, and the
11 power goes off and you don't know it at the house,
12 and the power's off all night. Well, that creates
13 all kinds of problems, and we may figure out some
14 relationship between Duke and the turkey farmer
15 that allows us to monitor the power there on a
16 real-time basis, so that, if the power goes out,
17 we're there and we know that we need to repair that
18 in a matter of a few minutes.

19 **COMMISSIONER MITCHELL:** I appreciate you doing
20 that.

21 **CHAIRMAN HAMILTON:** How much is it going to
22 cost him?

23 [Laughter]

24 **MR. MANNING:** We'll leave that up to you guys.
25 Okay. If you take that one more step, and that

1 step is the smart grid, it's the integration of
2 smart meters -- and not just the smart meter, but
3 the information that the smart meter gives you.
4 It's the integration of that information and meter
5 with the system itself.

6 This is primarily a distribution system model.
7 It means that the protective devices that are out
8 there along that distribution system will talk to
9 the meters, such that, if you realize there's a
10 real-time thing happening, you can deal with it,
11 and deal with it immediately.

12 And I'll give you an example of that. Last
13 summer we had 20, 25 days in a row over 90 degrees
14 and our distribution system was severely stressed.
15 We had a lot of load issues. We had constantly --
16 we were out virtually every night, all night,
17 dealing with issues all around the system,
18 stressing wire, stressing transformers, stressing
19 protective devices.

20 What this system will allow you to do is
21 monitor that in real time and, if you have the
22 opportunity and if you've established this
23 relationship with customers to execute load control
24 on a real-time basis, you may spot, execute load
25 control in one subdivision, to reduce the load on

1 that particular wire size, and hold it there until
2 night until you were allowed to recover some. And
3 in that way, you avoid an outage altogether, which
4 may have -- before, we would not have known that
5 that was occurring until after the outage had
6 already happened.

7 So you can start to see -- particularly if you
8 automate that sort of decision, you can start to
9 see how this might move amongst the millions of
10 customers and create a real step change in how that
11 system performs. It's really exciting to think
12 about the kinds of opportunities that this provides
13 you.

14 And it's not so much just the opportunity to
15 prevent, but also the response part -- and I'll
16 talk about that. In fact, let's move that today.

17 I do want to say one thing, though, about
18 renewable generation before we move to that slide.
19 We have struggled through the years to figure out
20 how to integrate someone who wants to put a
21 generator at their house and then connect it to our
22 system. And I will leave the rate issues up to
23 folks like Carol, because those are challenging
24 enough, but it's not just the rate issues; it's the
25 actual management of the flow of energy that occurs

1 when you have multiple sites and multiple supplies
2 of energies. And if you think about the
3 implications of having a circuit with 2,000
4 customers on it, what if 1,000 of those people had
5 solar panels on their house? How would you
6 integrate that, such that you know which way the
7 energy is flowing, what the loads would be on the
8 wire? Some of the fuses, some of the devices we
9 have, only look in one direction. So what if the
10 energy is turned round and flowing in the other
11 direction?

12 We really have a lot of limitations in how we
13 can control and manage that grid today, and what
14 this technology provides you -- particularly, in
15 the smart grid technology -- is the opportunity to
16 know what that is in a real-time way, and adjust
17 the criteria associated with that circuit in a
18 real-time way, so that if you need to -- if you
19 need to lower the amount of current that it takes
20 to interrupt a protective device, you can do that
21 automated through a computer. If you need to raise
22 it, you can do that in an automatic way through a
23 computer. You just can't make that many decisions
24 on a real-time basis with human beings in today's
25 market.

1 So if you're going to see a future that has
2 the integration of multiple deployed technology,
3 you really have to move in this direction to make
4 it work. Otherwise, it's just too much of a
5 challenge, I think, to get there.

6 So I want to talk just a little bit about --
7 to give you an example of the difference -- to talk
8 a little bit about how we manage outages. And this
9 is kind of a graphic of how we would do that today.
10 Step one, an outage occurs. It's interesting, this
11 is not a tree outage, I see; it's a big X on a
12 pole, so it's something else. It's not a tree
13 outage. But the outage has occurred, and the way
14 that you deal with that today is, the customer must
15 call. If the customer doesn't call us, there are
16 only a few places where we actually know that an
17 outage has occurred. Those are beginning to move,
18 as we have deployed some of this technology as I
19 talked about beginning in 2006. We have a few
20 points out there on our system where we can monitor
21 it real-time ourselves.

22 But for now, for 95 percent of our customers,
23 in order for us to know that you have an outage you
24 have to call us. Now, in steps two, three, and
25 four, you'll either get a live voice at our call

1 center or you may call 1-800-POWER-ON. In both of
2 those cases, they feed that information into our
3 outage management system, and our outage management
4 system will then cause that information to flow
5 through to a dispatcher. And the way that that
6 happens depends on how many outages there are, but
7 the routine, the way this would happen on any given
8 night, for the most part, is an outage ticket
9 actually prints out on the dispatcher's desk.

10 So it's kind of old school. That's the way we
11 do it on a routine basis, is the outage -- the
12 dispatcher's sitting there, something pops up on
13 her desk in a printout, and she takes that and she
14 will call a crew, a work crew, and will dispatch
15 them based on the information that's provided by
16 the outage management system.

17 That information is as good as the information
18 our customers give us. If a customer saw a
19 problem, then that's very helpful, and we provide
20 that information to the crew. More often than not,
21 what we get is, "I heard an explosion. I don't
22 know what it is." Or, "My transformer blew up."
23 We get a lot of transformers blowing up, in the
24 customer's eyes. And what we find is it's
25 something that's miles away that's created the

1 problem. But when you dispatch the crew, you
2 dispatch the crew based on the information that you
3 have. And in many cases, that doesn't necessarily
4 send the crew to where the outage occurs, but it
5 sends the crew to the customer's home, and then we
6 have to work our way back.

7 More often than not, it's dark. There are a
8 lot of times when lines are -- the City of
9 Greenville, for example, a lot of those lines are
10 in backyards, and you find yourself at night
11 crossing fences, going in and out of yards, walking
12 through people's backyards at 2 a.m. with big,
13 giant flashlights, shining them up into the air
14 looking for problems.

15 So that's one of the challenges we face, and
16 that's one of the reasons that we have an outage
17 duration that takes a couple of hours to deal with
18 most outages on an average basis.

19 So once the crewman is able to find the outage
20 and restores the power, then we find ourselves
21 faced with an issue of do you call the customer
22 back or not, to confirm the power is back on? And
23 as you've known, I'm sure, through the years, we
24 have a policy of calling customers back. Now we
25 stop that at about 10 o'clock at night and we start

1 it back about 6:30 or 7 in the morning, and that --
2 those time frames were actually -- they come from
3 the school of hard knocks, from calling some folks
4 at 2 a.m. and 3 a.m. and telling them, "Hey, did
5 you know your power's back on?" And you get a few
6 of those, "Do you think I'm an idiot or something?"
7 But it's not because we want to be nice; it's
8 because we don't know, until we call them. So it's
9 a part of our process to figure out what's out
10 there that is still off.

11 This is a big problem during a major storm.
12 During a major storm, we are not dispatching by
13 customer, because we have so many outages; we're
14 dispatching by protective device. And we may pick
15 up a protective device, but if a particular
16 customer's home is off because their service, for
17 example, has pulled away from the house, then
18 there's no way for us to know that, without
19 actually walking out to that customer's home or
20 asking that customer to call us back.

21 Now, if you look at how we would see it
22 working with smart grid -- and some of this is
23 experimental and we're just figuring out how to
24 make it work, but the flow is much different. Once
25 an outage occurs, we would expect that -- we will

1 figure out how to make that meter immediately
2 contact us and tell us the power is off. And that
3 takes place in microseconds. In microseconds we
4 would know that the power is off, not only at one
5 place but all the places that are impacted. So you
6 don't have to wait for logic to roll up within our
7 outage management system to figure out, "Well,
8 there's 62 customers off; therefore, it must be
9 this protective device." This will instantly tell
10 you 62 customers are off, it's got to be this spot.

11 Not only will it tell you exactly what the
12 spot is, but it gives the dispatcher the option of
13 actually calculating, based on the information
14 provided by the devices and the meters, where could
15 that fault have occurred. We can analyze the fault
16 currents that came in across the protective devices
17 and we can tell from analyzing that circuit that it
18 looks like there's a tree on the line between pole
19 6 and pole 16, and we make a dispatch of that crew
20 then within a few hundred feet of where there's a
21 tree on the line. Much better than walking through
22 folks' yards and in the back of their homes at 2
23 a.m. Much better than that.

24 Yes, sir.

25 **MR. MELCHERS:** Quick question. Does it tell

1 you that power is out by an absence of a signal?

2 **MR. MANNING:** Well, that's a good question,
3 because we haven't figured all that out yet. We're
4 still -- as Matt can tell you, we're working
5 through how that's going to happen. There are a
6 lot of different options that you can have. One is
7 you can constantly be looking out to see who has a
8 signal and who doesn't, and in that case you would
9 pick it up if they don't have a signal. So that
10 would be the absence of a signal. There's also a
11 technology that's called Last Gasp, which would
12 have a capacitor built into the meter, which would
13 say, once the power goes off, that capacitor will
14 discharge and send you an immediate signal, and
15 that's the last gasp that meter will give you
16 before it's out.

17 Matt, anything you would add? Matt's my
18 metering expert.

19 **MR. SMITH:** That's a tall order to live up to.
20 The one thing I would say is, the importance of
21 having the smart grid versus just the smart meter
22 is that your assets all along the distribution
23 system would work in concert to help you determine
24 if it's one meter in one home that's without power,
25 or if it goes further up the circuit or even the

1 substation, so instead of having hundreds of
2 thousands of meters shouting their last gasp at you
3 and overwhelming you, it would work back into the
4 system and you may have five meters roll up to a
5 transformer, and then at that point the transformer
6 would take over and let the meters be quiet, and
7 then roll back up, and be checking all along the
8 way to say do I have power, do I have
9 communication, what is the issue, and again rolling
10 it back up to a point where it knows and then
11 telling us -- or back to the head-end system --
12 here's the problem, instead of being overwhelmed
13 with thousands and thousands of messages.

14 **MR. MELCHERS:** So all the technology choices
15 consider sending signals through the lines; it
16 wouldn't be some type of a wireless?

17 **MR. MANNING:** It's a mixture of all of those.
18 In fact, we're still in pilot stages, so we haven't
19 determined exactly what we think the best
20 communication mechanism might be, but we're trying
21 all of it. We're trying powerline carrier, but
22 we're also trying cell phone modems, the same thing
23 that's on your Blackberry. And those are working
24 just fine.

25 So it probably will come down to what's the

1 most reliable and what's the most reasonable cost.
2 Matt, anything you would add?

3 **MR. SMITH:** Well, I'll just give an example of
4 what we're using today in one area: a powerline
5 carrier from the home, from the meter to the
6 transformer. You're on a very reliable, very easy-
7 to-use medium, the powerline, which goes to every
8 home. And then at the transformer it picks up a
9 wireless signal, which takes it to a local area, a
10 local area of wireless components, and then when it
11 gets to a certain backhaul point there's a fiber
12 line, the Internet basically, that then brings it
13 back to our head office. And as Rob said, we're
14 still trying these, but we're seeing that if we use
15 a combination of technologies, we get more reliable
16 communication and more secure communication.

17 So as you get closer to the home, you're
18 getting the most secure communication methodology,
19 and then as you move back into the system, you can
20 add insecurity; you can add software suites, et
21 cetera. But the combination, we're finding --
22 instead of using one technology -- the combination
23 gives us greater reliability and redundancy than we
24 could have with one technology.

25 **CHAIRMAN HAMILTON:** The time frame you're

1 talking about would still be almost instant?

2 **MR. MANNING:** That's right.

3 **MR. SMITH:** Yeah, it's amazing. It is. And
4 you can reach out to that meter or those other end-
5 points, the transformer, instantly. You can send a
6 message asking it, "Do you have power? What is
7 your status?" And it's just like an e-mail or a
8 phone conversation, basically. It's that quick.

9 **MR. MANNING:** You start to see -- I can start
10 to see, because I also manage the transmission
11 system, and a lot of the systems that we have had
12 in place on the transmission grid for a long time
13 will make decisions in milliseconds, and there's no
14 human involved until after the fact. And you can
15 start to see that moving down onto the distribution
16 grid, so that instead of having a circuit with
17 3,500 people on it out of power, it may have
18 isolated a single transformer with only a few
19 customers on it. So, you dramatically improve
20 outage response for all the rest of the people on
21 that circuit, and you've got the information you
22 need to go repair that one particular area.

23 **CHAIRMAN HAMILTON:** Would it be so smart that
24 it possibly could correct itself or reroute power?

25 **MR. MANNING:** That's a great question, because

1 Catherine just asked me in my other ear.

2 MS. HEIGEL: I'm sorry.

3 MR. MANNING: We do have places today where we
4 have that capability, but it's not as fast as this
5 would provide you that opportunity. The downtown
6 underground systems, for example, have backup
7 sources. In order to reroute, you need backup
8 sources. We have backup sources in some places,
9 but not many. Our system is predominantly a rural
10 system, and in a rural system it's more a spider
11 web out that doesn't connect back. In the cities,
12 however, we have a lot of interconnections, and
13 where we have those interconnections you can make
14 those real-time decisions to isolate down to the
15 fewest number of people impacted by an outage, and
16 you may choose to pick up people off the back side
17 of that circuit from a different circuit and
18 backfeed it from another direction.

19 So those are the kinds of things that are
20 certainly within the realm of possibility. And, in
21 fact, a number of those are already in play today.
22 There are things called -- there's an industry term
23 called self-healing network, so you can move
24 towards this self-healing network that would
25 eliminate outages for all but those directly

1 impacted by that particular outage.

2 **CHAIRMAN HAMILTON:** So, the consumer could
3 basically, possibly just see a blink, and
4 everything takes care of itself.

5 **MR. MANNING:** Exactly, could just see a blink
6 and everything is restored. So it's a dramatic
7 improvement for the distribution customer. It's
8 the kind of things that transmission customers,
9 those largest customers who are served directly off
10 that transmission grid have come to expect through
11 the years. And we believe with this technology you
12 could start to push that out into the distribution
13 customers.

14 **COMMISSIONER FLEMING:** What about the other
15 states that have already had smart grid, are they
16 using a combination of these methods? Are you
17 learning from them?

18 **MR. MANNING:** I'm no expert on it, but we are
19 learning from it. In fact, we sit down with
20 Progress Energy, and Progress Energy is doing a lot
21 associated with fault-finding, for example, is one
22 of the options through the relays that are out
23 there. So we've been working with Progress on
24 that. We've been working with Florida Power &
25 Light. A lot of people are doing small components

1 of this. There's no one doing it all. And a lot
2 of those states are deploying AMI, instead of smart
3 meters, so they don't really have the capability to
4 move in that direction.

5 A couple of examples: Georgia Power put in a
6 self-healing network a few years ago for the
7 Olympics, as an experimental -- on an experimental
8 basis. It's still in place today, and as far as I
9 know, it's still working and working well today,
10 just to serve the greater downtown area and the
11 area around the Olympics.

12 **COMMISSIONER FLEMING:** But I'm talking more
13 about like Pennsylvania and Wisconsin, that have so
14 much about notifying you all, the method of
15 notifying.

16 **MR. MANNING:** I don't -- Matt, do you know
17 anything more about Pennsylvania or --

18 **MR. SMITH:** I think it's similar to what Rob
19 was saying, they seem to be very isolated looking
20 at a metering solution, differently from the
21 distribution -- broader distribution grid, very
22 stepwise, so once they get the metering -- or, this
23 is what their plans appear or what they talked
24 about. They'll get the metering piece in place and
25 then build on top of that the smart grid, instead

1 of looking at it holistically, how do we build this
2 more intelligently up front?

3 **COMMISSIONER FLEMING:** And you were saying
4 broadband is essential. Is that -- I know that you
5 all were experimenting in some neighborhoods,
6 putting broadband in earlier. Was this kind of a
7 precursor to that, this?

8 **MR. SMITH:** It has been. That was one of the
9 initial ideas of trying to use the powerlines as
10 much as we could for this entire smart grid
11 project. And we found that there's instances where
12 we can use that very effectively. The technology
13 has not kept pace like we thought it would, so
14 we're now looking at the combination of that and
15 wireless and even powerline -- non-broadband
16 powerline communication. But as Rob mentioned, the
17 real key is having broadband as deep into the
18 network as we can.

19 And when we say broadband, it's not
20 necessarily what you would think from a consumer
21 standpoint of being able to watch video on your
22 home computer, but fast enough to take packets of
23 information from millions of meters at a time. So
24 although it is a broadband, technically, it's not
25 what you would think in a consumer standpoint,

1 broadband.

2 **CHAIRMAN HAMILTON:** Let me ask you, you
3 mentioned earlier about some places were doing part
4 but not all, and different people doing different
5 things. The meters that they have in now, are
6 those meters going to be obsolete when they have to
7 go to the next step?

8 **MR. MANNING:** That could very well be. The
9 metering -- the folks who manufacture the meters
10 today will tell you no, but I'll give you an
11 example of one of the issues we've had, is when
12 Congress changed the time for daylight savings
13 time, we had to go out to 4,000 meters -- more than
14 4,000, I believe -- and actually make that
15 programming change in the meter. Meters become
16 obsolete very quickly. And I believe those AMI
17 meters -- correct me if I'm wrong, Matt -- I
18 believe those AMI meters will be considered
19 obsolete in short order. That's just personal
20 belief.

21 **MR. SMITH:** They're very much like a personal
22 computer with a meter technology inside of it. And
23 when you think about how rapidly computing
24 technology changes, although the metrology -- the
25 metering technology -- won't change much, all the

1 components that surround it will change rapidly,
2 and just like we see with cell phones and iPods and
3 personal computers, in seven to ten years there
4 likely will be something ten times better for at
5 least, you know, half or less of the cost. So I'm
6 with Rob, I think that we will see they will become
7 obsolete.

8 **CHAIRMAN HAMILTON:** And the basic smart meter
9 now, what's the approximate cost?

10 **MR. SMITH:** It can be anywhere from as low as
11 \$60-65, up to \$150-175, for a residential meter.
12 For a commercial or industrial meter, they can go
13 \$3-400.

14 **CHAIRMAN HAMILTON:** Okay. Not as expensive as
15 I had thought they were.

16 **MR. MANNING:** They're also brand new. In
17 fact, the first group we got came right off their
18 test panel and were built by hand, manually. So,
19 we would -- and Matt and I have had this
20 conversation. We would expect that cost to come
21 down when we start ordering a lot more and they're
22 into -- we already have them into a mechanical
23 process today, but we would expect that cost to
24 come down as we increase the volume of orders.

25 **MR. SMITH:** Sure. Much like the computer,

1 it's made up of components of plastic, silicon,
2 microprocessors, not copper and steel, so we're
3 seeing just the component parts, those costs,
4 decreasing because it's technology, just like,
5 again, the computer and iPod, what you bought a
6 year ago is much cheaper today. And because it's
7 the same component parts, we expect to see the same
8 price declines.

9 **CHAIRMAN HAMILTON:** Thank you.

10 **MR. MANNING:** The one analogy I've used when
11 I've talked about this is, if you think about AMR
12 and the movement from AMR to AMI, the two-way
13 communication, it's analogous to the old bag phone
14 that we all carried around in the car, to today's
15 cell phone. But when you're thinking about the
16 smart meter, it's moving from the bag phone to a
17 Blackberry, or something, that you not only have
18 voice communication but you also have data and
19 capability to go back and forth, and so forth.

20 **CHAIRMAN HAMILTON:** Talking about metering,
21 this is a good time for me to tell my meter story
22 that I just learned from a meeting I had in
23 Washington with a Commissioner from Connecticut.
24 He said at each family dinner that they went to,
25 that his brother-in-law was always on him about his

1 utility bill. And, of course, if I lived in
2 Connecticut, I might be the same way. But anyway,
3 he said, well, he told him at Thanksgiving dinner,
4 said, "Look, let me pay for the people to come out
5 and check your meter and audit your utilities."
6 And I think it was a \$15 fee, and the fellow agreed
7 to let him do it, so he did it.

8 They came out, checked the meter, and the
9 meter was slow, and they replaced it. And he said
10 he hasn't been -- he didn't get invited to
11 Christmas dinner.

12 [Laughter]

13 And this is supposed to be from the truth. So
14 the new meters aren't going to be slow or fast,
15 they'll be calibrated --

16 **MR. MANNING:** They'll be calibrated and
17 accurate, and we actually have found some slow
18 meters in our tests and in our pilots, by putting
19 these out there.

20 **CHAIRMAN HAMILTON:** You always take a risk
21 when you ask you fellows to come check.

22 **MR. MANNING:** Absolutely. I have no doubt
23 that story is true.

24 **COMMISSIONER HOWARD:** Mr. Manning, I have a
25 question on my thought process. Is this program to

1 be mandatory? I mean, are all your consumers going
2 to have to -- when you implement the program, will
3 all the consumers in a particular area, whatever
4 the case may be, will it be mandatory that they're
5 going to have to go to your smart meter?

6 **MR. MANNING:** That's an excellent question,
7 Commissioner, and I don't think we've figured that
8 out yet. We're still trying to figure the
9 technology out, to see what the availability might
10 be, and we haven't begun to start putting the
11 programs together on how we might offer those
12 programs, unless Carol or Diane -- you folks might
13 have any more information. I think the answer to
14 that question is, we don't know.

15 **COMMISSIONER HOWARD:** And then in follow-up --
16 it may be a premature question to follow up with,
17 but who would pay for the meters? I mean, assuming
18 here's the scenario: number one, it's mandatory;
19 you have to. Would you all put it in rate base, or
20 each customer pay for the meters. And again, if
21 it's volunteer, would the customer pay for the
22 meters or how would the cost of the meters be
23 distributed throughout the --

24 **MR. MANNING:** Our preference would be -- or,
25 do you want to take this? Our preference would be

1 that it would be a part of rate base.

2 **MS. DENTON:** Right, just as meters are today.

3 **MS. HEIGEL:** Today, correct.

4 **VICE CHAIRMAN MOSELEY:** But if I live next to
5 O'Neil and I let him get the smart meter, I don't
6 want a smart meter, so I'll just let him pay for
7 it.

8 **CHAIRMAN HAMILTON:** No, you're going to help
9 pay for mine.

10 **VICE CHAIRMAN MOSELEY:** I know, if it's in the
11 rate base.

12 **CHAIRMAN HAMILTON:** And I appreciate it.

13 **MR. SMITH:** I think one fine point to put on
14 that, as we look at how we would deploy across the
15 service territory, some of the operational benefit
16 is dependent on having a wide deployment. So if I
17 have one home that has a smart meter and the home
18 next to it does not, that likely increases my
19 operating cost because I'm reading that meter in
20 two different manners, so I may be sending a person
21 or a truck to drive by the one meter and then
22 reading the other over the communications system,
23 and we would likely see costs go up for
24 communication because we're doing it over fewer end
25 points, and through the drive-by or the mobile

1 system, because we're driving by more areas picking
2 up less meters.

3 So, as Rob said, we haven't figured out what
4 that deployment is, exactly, but just the pure
5 economics point toward reducing operating costs by
6 leveraging millions of end points, or more of the
7 meters being the smart technology.

8 **CHAIRMAN HAMILTON:** Thank you.

9 **MR. MANNING:** One last point on this slide,
10 and I'll move on, and that's under Step 7, which
11 really becomes Step 2, also: You don't have to
12 call anybody back. Once the power is restored, you
13 can go out and search, or you can have that meter
14 notify you immediately, so there's no requirement
15 to call anyone back to know that the power's back
16 on.

17 Particularly powerful during a major storm of
18 some sort. If there's a major storm outage, as we
19 talked about earlier, if the service is off at a
20 given house, I can go out and do a search in that
21 neighborhood and I can find out who is still off.
22 And that has significant opportunity for us to
23 reduce our cost during major storms.

24 As you know, the last couple of the days of a
25 storm are the most difficult to manage, because you

1 have such dispersed outages, and we tend to hold
2 crews, not knowing what we have, until we figure
3 out what we have, and there's a lot of inefficiency
4 in that last day or two, and you could really zero
5 that down in a matter of moments, and possibly
6 release crews a day earlier than we're currently
7 releasing them today.

8 During a major storm in 2002, I think we were
9 well over \$1 million a day on just crews that were
10 sitting out there, so you can start to see how you
11 can reduce those costs dramatically with that kind
12 of information.

13 **COMMISSIONER MITCHELL:** Yes, sir. If you
14 decide to implement this, will North Carolina and
15 South Carolina be brought in together, or would it
16 have to be a plan that maybe North Carolina has to
17 have a percentage before South Carolina, or will it
18 be jointly? Or have you even decided?

19 **MR. MANNING:** We haven't decided. We are
20 piloting it in both states. And this is the first
21 official meeting we've had on that, but we are
22 piloting it --

23 **COMMISSIONER MITCHELL:** So that means --

24 **MR. MANNING:** -- in both states.

25 **COMMISSIONER MITCHELL:** -- we're going to be

1 first, then?

2 [Laughter]

3 **MR. MANNING:** This is the first official
4 meeting we've had. You could be first.

5 Diane, anything?

6 **MS. DENTON:** No, I think that's right. We
7 haven't decided, and as we said, we're kind of
8 taking the first step today, and Rob and Matt can
9 talk a little bit about what we are doing now in
10 South Carolina.

11 **MR. MANNING:** Actually, I can move to the
12 slide. That's a good segue. We're putting out
13 about 7,500 meters in South Carolina, in the
14 Greenville area, this year. In fact, they will be
15 out in the first half of this year, so they will be
16 done by midsummer. And we are testing the
17 technology, the smart meter technology. It is
18 brand-new technology, and there are a lot of things
19 that we want it to do that we haven't quite gotten
20 it to do exactly the way that we want it.

21 We're still working those meters to make sure
22 that they meet requirements of accuracy,
23 consistency, reliability. So we're not quite ready
24 to make this ready for primetime, but it's getting
25 close. We're finding the accuracy level of the

1 meters is excellent and we are finding that -- the
2 first batch of meters we got, for example, we had
3 to send half of them back. That error rate is down
4 dramatically at this point. We're down, what, the
5 2 percent range, I think, Matt?

6 MR. SMITH: Uh-huh.

7 MR. MANNING: So we're getting down into a
8 more manageable error rate with the production of
9 these meters. It's doing exactly the kinds of
10 things that you would expect in a pilot. It's
11 surfacing the issues that we know we have to deal
12 with from a technology perspective, and it's
13 teaching the manufacturer how to build something
14 that can be useful in a productive way, instead of
15 just in a test way.

16 So, all that seems to be going well. But
17 we're also trying to figure out how we might deploy
18 lots of these, because if we want to put them
19 across two states, that's a lot of places to be.
20 And, in fact, Duke Energy's plan is to put them
21 across five states. So we have to figure out
22 what's our capability. How quickly can we deploy
23 them? How quickly do we want to deploy them? How
24 quickly can the manufacturer manufacture these
25 devices? How fast do you integrate these with

1 other components of the smart grid? What are the
2 other components of the smart grid? There are so
3 many questions to be answered that we're still
4 working through today.

5 Anything, Matt, you would add?

6 **MR. SMITH:** Well, if I could just add about
7 the technology, although it is new and the
8 combination of the pieces of technology is new, the
9 technology itself is not, necessarily, and I'll use
10 the meter for example. Across the world, there's
11 nearly 30 million of these types of meters. So
12 it's new for us, it's new to North America, and
13 putting the meter and the cell phone and the
14 powerline combination is somewhat new. All the
15 devices themselves are not. And, again, I point to
16 having 30 million worldwide, so it's a pretty good
17 track record for us to look back on. We don't have
18 30 million, so, of course, we're interested in what
19 it means for us, not just those folks in Europe or
20 Asia.

21 **COMMISSIONER FLEMING:** Well, that was what I
22 was wondering, why is it still so experimental,
23 since it's already in other states?

24 **MR. SMITH:** yeah, it's the combination of
25 technology that we're looking at, that Duke Energy

1 specifically is looking at. And one of the core
2 tenets we've had in this project is that we want to
3 choose technology that is open architecture and
4 flexible, meaning you can take technology from
5 Company A and technology from Company B, and put it
6 together and it will work.

7 What we're seeing in other jurisdictions is
8 they're picking Company A as their technology
9 vendor, and they are implementing that technology
10 at all points along their system, so the meter
11 communication is all Company A. If they want to
12 integrate technology from Company B, they can't,
13 quite frankly, or they have a large integration
14 cost to be able to put those technologies together.

15 We are very focused on being able to use the
16 best technology from the best vendor. So our
17 metering company, we think, is one of the best
18 metering companies there is. We don't want them to
19 also have to be our communication provider. We
20 want to be able to go to those who are very best at
21 communication, like AT&T or Verizon, for example,
22 put those two technologies together, and have the
23 best of all classes.

24 And that's what's new, that's the challenge
25 that we face, the stuff that Rob mentioned is being

1 tested, how that combination works, not necessarily
2 how each piece works.

3 **COMMISSIONER FLEMING:** So it won't be
4 standardized, then, across the country; it will be
5 unique to the power companies?

6 **MR. SMITH:** Well, we're working on trying to
7 get that standardized. We think our view of having
8 the best technology vendor in each space is the
9 best idea, and it's moving -- it's new enough in
10 each jurisdiction that we still are discussing that
11 as peer utilities, how do we get that lowest cost,
12 most optionality, best deal for our consumers,
13 moving forward.

14 What we want to avoid is coming back here in
15 ten years and saying, "Hey, we picked really good
16 technology for the time, but it's totally obsolete.
17 We have to take everything out." We may come back
18 and say, "Well, the meter's obsolete, but all of
19 our communication infrastructure, all of our
20 transformers, reclosers, et cetera, are fine, so
21 instead of having to take it all back, let's just
22 replace the obsolete part."

23 So we're trying to share that view with our
24 peer utilities and help them see the advantage of
25 doing that today versus doing it in the future.

1 **MR. MELCHERS:** Based on your figures on the
2 current slide, that priced out at up to \$400 per
3 residence, and that cost includes the equipment up
4 the line, not just the smart meter; is that right?

5 **MR. SMITH:** That's correct. What it includes
6 today would be the meter, the communication, a
7 collection mechanism to collect the data from the
8 meters, and then also some points on the
9 distribution system. So some of the transformers
10 where we are gathering information, some
11 distribution automation, but limited at this point.

12 **MR. MELCHERS:** And since this is a pilot
13 project, you're saying this is a more-expensive-
14 per-meter solution.

15 **MR. MANNING:** Absolutely. It's an
16 inefficiency of every mechanism. It's a pilot with
17 every mechanism. It's first-generation technology
18 that was a part of the 7,500, so it's not anywhere
19 near as efficient as we can be on a large-scale
20 deployment.

21 **MR. MELCHERS:** What would be an optimistic
22 viewpoint on the magnitude of improvements on a
23 per-meter cost? In other words, if it's this \$400
24 a unit right now, what are you hoping for if you
25 distribute this?

1 **MR. MANNING:** I'll let -- Matt's the project
2 manager. I'll let him commit us.

3 **MR. SMITH:** Yeah, well --

4 **MS. HEIGEL:** You did call for an optimistic
5 view.

6 **MR. MELCHERS:** I did.

7 **MS. HEIGEL:** Just clarifying.

8 **MR. SMITH:** Well, I'll try and bound this a
9 little bit by saying what we're looking at today
10 and what we think is realistic, and then we can
11 talk optimistic also.

12 But we think a 10 percent to 15 percent
13 reduction is achievable in the near term, being
14 from now to year three. So if we started deploying
15 today, we think by the time we got to year three,
16 we would be more efficient at putting it out on the
17 system and the component costs and operating costs
18 would come down enough that we would see a 10 to 15
19 percent reduction.

20 Being very optimistic, I think we could see
21 maybe a 20 to 25 percent reduction, and that would
22 depend on a few things, and the key things would be
23 enough manufacturing volume that vendors could then
24 buy in bulk and start to bring down that cost. And
25 when I say volume, it's likely 500,000 units or

1 more a year. So when we're talking meters, I think
2 a full line of production is about 500,000 meters,
3 and that will drive the cost down probably as low
4 as they can go without going another 500,000. So
5 that's a big one.

6 The other are the vendor -- the partner costs,
7 so -- communication cost, for instance, if we
8 partner with a Verizon or an AT&T. When you start
9 the project and you have 1,000 transformers that
10 you're talking to, the cost will be much different
11 when you get up to 5,000 or 10,000. So again, by
12 year three, assuming their technology continues to
13 decrease in cost, we increase our volume of usage,
14 we would see some more discount.

15 It's new for our vendor partners also, so
16 Verizon, for instance, as we speak with them about
17 what we would use their network for, it's never
18 been used for that before. They've never collected
19 data from meters and transformers, and so they're
20 broaching this just like we are, trying to figure
21 out what is the right price, how much will we use
22 their network, will they have to build their
23 network up to support us.

24 So there's a lot of dependencies that would
25 drive those costs. So I don't want to try and say

1 there's no cost benefit or that we won't see any
2 decreases, but there are quite a few dependencies
3 that need to be worked out.

4 **MR. MANNING:** And obviously, you would not
5 want to spend this money unless you knew that there
6 were significant benefits and that those benefits
7 were not only to the customer but also to the
8 company. And I believe we've -- I believe we're
9 moving down that direction with these pilots
10 helping us identify the scope of those benefits.
11 And when we come back to discuss that, we'll have
12 more information around those.

13 **MR. SMITH:** And we're also -- just to add to
14 the South Carolina work we're doing, we're doing
15 some work in the Charlotte, North Carolina, area,
16 and then also in Ohio, in the Cincinnati area. So
17 we'll have multiple areas where we're pulling
18 information to help us make the best decision, not
19 just the one area. We would anticipate using what
20 we learn in Ohio, combined with what we learn here
21 in the Carolinas to drive the best decisions.

22 **COMMISSIONER HOWARD:** One other question.
23 Does innovative -- and I really appreciate the
24 proactive stance you're taking in this, but a
25 curiosity question. How do you arrive at a

1 depreciation factor with -- you know, you're
2 anticipating changes in the future and you don't
3 know, so when you come into a rate case or whatever
4 the case may be, how would a depreciation factor be
5 determined?

6 **MR. MANNING:** That's a very good question and
7 it is related, I think, to what you saw in Title
8 XIII, to the reference regarding obsolete
9 equipment.

10 Carol, would you address that?

11 **MS. SHRUM:** Yeah, well, I think you're right,
12 Rob. I think that's an excellent question, and one
13 that we don't know the answer to yet. I know that
14 folks have started to think about what will we do
15 in our next depreciation study, when you have types
16 of equipment like this that are rapidly changing in
17 what the technology is. So it certainly will have
18 to be evaluated.

19 **COMMISSIONER HOWARD:** Thank you.

20 **MR. MANNING:** One last slide. We thought --
21 and Matt has taken a lead on this as a project
22 manager. We thought that what we really needed is
23 a way to put all this together in one place, so we
24 could see everything working and understand how
25 it's all supposed to work, not just the smart meter

1 but the smart grid, the integrated renewable
2 resources, all that together.

3 So what we've done is we are deploying four
4 labs, demonstration labs, if you will. The first
5 one is actually up at Furman University and it's
6 near complete. In fact, we expect that to be open
7 in the summer. And it's a mock-up of our system, a
8 home, all the different technology options you
9 would have with this sort of system, so that you
10 can walk through and see how it would all work
11 together. We are planning one in Raleigh. The one
12 in Raleigh would be more geared towards regulators
13 and legislators, so that we could help people see
14 what are the kinds of technologies that we would be
15 using in those situations.

16 We are planning one in Charlotte, which is
17 much like the Furman University area; it's not
18 quite determined, the timeline on the Charlotte
19 one. Likewise, we're planning one in Cincinnati,
20 Ohio. Also, we haven't quite gotten the timeline
21 nailed on those, yet.

22 These provide an opportunity, and we'd love to
23 have you folks come and join us and walk through
24 those centers, whichever makes the most sense to
25 do, once we get those up and running.

1 **CHAIRMAN HAMILTON:** Sounds great.

2 **MR. MANNING:** Now, we have an actual
3 futuristic video, and I'll let Diane Denton show us
4 what those are. Diane?

5 **MS. DENTON:** Sure. We're just gearing that
6 up. This is a video that's been created through a
7 consortium of utilities to try and just get -- help
8 paint kind of the futuristic vision of smart grid
9 technology. So, it's illustrative. I mean,
10 everything that you see in here may or may not be
11 possible, may or may not be included in Duke
12 Energy's vision, but we found that it's really
13 helpful to kind of help paint the picture,
14 particularly from the customer's standpoint.

15 The year is 2015, and some students at Thomas
16 Jefferson High School have been asked to give
17 presentations on their family's energy use, their
18 home, and their communities. And we're just going
19 to show you -- the actual DVD that's being
20 developed has, I think, about eight little
21 vignettes on it. In the interest of time, we've
22 chosen three that we think are well representative
23 about what we've talked about today.

24 **MR. MANNING:** Thomas Edison High School.

25 **MS. DENTON:** Thomas Edison, yeah.

~ ~ ~ ~ ~

[WHEREUPON, Video Clip #1 was presented;
a transcription of the audio portion
follows.]

INSTRUCTOR: We talked about things like
carbon footprints and sustainable resources.
Jenna's report speaks to our section on protecting
the environment by lowering energy usage. Jenna.

STUDENT (JENNA): Okay. So, everything in our
lives is driven by electricity, right? For this
assignment, I decided to see how the utility
company could help us understand the way my family
uses energy and manage it better, reduce our carbon
footprint and all. So I gave them a call.

They told me the first step was to take a look
at my family's account page. In our profile, I
found this big, glowing dot that measured how much
energy my family was using.

A lot, it seemed, by how red the dot was. And
I could also see how we compared to our neighbors.
We were using a lot more energy. So I decided my
project would be to try to get smarter about how we
use energy, and try to do better than our
neighbors.

Our first step was pretty easy. We already

1 had compact fluorescent bulbs in our house, but the
2 utility company encouraged us to switch to LED
3 lighting. They also helped us install a new
4 thermostat. Well, it's really more than just a
5 thermostat. It tells us the price of energy and
6 manages our heating and air conditioning. If the
7 price of energy is high and we're not at home,
8 it'll adjust automatically, saving energy and
9 saving us money. Even better, my dad can adjust
10 the settings from his computer, even if he's at
11 work.

12 The changes helped, but we still had a long
13 way to go. That's when my dad's competitive side
14 kicked in.

15 The utility's site showed us that it's better
16 to run appliances, like dishwashers, at low-energy
17 times, like at night. So, my dad installed smart
18 appliances that would do just that.

19 A widget on the utility web site showed us how
20 much we would save over time. The new appliances
21 weren't cheap, but we could easily calculate that
22 they would pay for themselves within a few years.

23 We replaced our washer and dryer, and even
24 automated all the lights in our house and, as you
25 can see, working with the utility, we're doing

1 really well, even better than some of our
2 neighbors.

3 I never really thought that turning off a few
4 lights or adjusting the thermostat a few degrees
5 would make that much of a difference, but it does.
6 And now it's like the house thinks like we do. It
7 interacts with us. It's cool.

8 [WHEREUPON, Video Clip #2 was presented;
9 a transcription of the audio portion
10 follows.]

11 **INSTRUCTOR:** Sometimes managing your energy
12 usage means controlling your expenditure. Joshua
13 is reporting on how his grandmother manages her
14 monthly budget. Joshua.

15 **STUDENT (JOSHUA):** For my report, I focused on
16 my grandmother. She's pretty resistant to change
17 and not very savvy when it comes to technology. I
18 even had to set up her Family Book page. [Students
19 laugh.]

20 Anyway, she recently retired and only gets her
21 pension, so she was looking for ways to better
22 manage her costs with her bills. The utility had
23 several options, but the one she got excited about
24 was signing up to have this smart meter installed
25 in her house, which gave her total control over her

1 spending and helped her work with her utility to
2 better manage her energy usage.

3 **COMPUTER VOICE (to grandmother):** Hello, Mrs.
4 Anderson. The current balance on your account is
5 \$67.15.

6 **STUDENT (JOSHUA):** She can see how much she's
7 spent at any time, how many units she was using
8 that day, what appliances were costing her the most
9 money, and when her next payment would be.

10 **COMPUTER VOICE (to grandmother):** Are you
11 happy with your bi-monthly payment plan, or would
12 you like to modify?

13 **STUDENT (JOSHUA):** Right away, she saw how
14 easy it was. She was the one who could control her
15 spending, and if she had any questions, there was
16 always a live representative available.

17 My grandmother liked the way she can manage
18 her spending and chose something called the Energy
19 Saver Plan. It's a tool kit full of options to
20 keep her energy usage in line with her budget.

21 Then, a month later, the heat wave hit. It
22 was one of those epic heat waves, like 106 in the
23 shade. On the hottest day of the year, everyone
24 was using their air conditioner.

25 My grandmother was, too. She had it cranked

1 all the way up. She was well on her way to
2 exceeding her energy budget for the month. So, the
3 utility company actually contacted her.

4 **COMPUTER VOICE (to grandmother):** We are
5 expecting that the heat wave will peak on
6 Wednesday. At your current energy usage, you will
7 exceed your target budget...

8 **STUDENT (JOSHUA):** My grandmother had asked
9 the utility to send a signal that would adjust her
10 thermostat by just a few degrees when energy prices
11 were the highest.

12 **COMPUTER VOICE (to grandmother):** To meet your
13 goal, we are preparing to send a signal
14 adjusting...

15 **STUDENT (JOSHUA):** But it also gave her the
16 choice of how much. She decided it was just too
17 hot. It was worth a few extra dollars to stay
18 comfortable.

19 **COMPUTER VOICE (to grandmother):** Would you
20 like to maintain your current temperature? Please
21 press "yes" or "no."

22 **STUDENT (JOSHUA):** So with the help of her
23 utility company, she's the one who's in control of
24 her budget, and also how she wants to live.

25 ~ ~ ~ ~ ~

1 **MS. DENTON:** I'm going to skip ahead two of
2 these, and go to one on outages.

3 ~ ~ ~ ~ ~

4 [WHEREUPON, Video Clip #3 was presented;
5 a transcription of the audio portion
6 follows.]

7 **INSTRUCTOR:** Maria, you're covering the recent
8 storm for your report. What happened when the
9 lights went out?

10 **STUDENT (MARIA):** Well, I'd always wondered
11 what was happening behind the scenes, so after last
12 month's big storm, I called the utility to find
13 out.

14 If you remember, that storm came up pretty
15 fast. And my grandmother was home that night, and
16 so was my mom. My dad was trying to get home from
17 work.

18 **DAD'S VOICE (to Mom via phone):** Honey, it
19 looks pretty bad out here. My GPS is telling me
20 there's a big storm coming. It's telling me to
21 take a different way home. It looks like I'm going
22 to be delayed.

23 **STUDENT (MARIA):** The utility company jumped
24 into action. There's this thing called the smart
25 grid that allows them to pinpoint the location of

1 the outage. They dispatched workers to the scene
2 right away.

3 **DISPATCHER'S VOICE:** Dispatching 24, go to 525
4 Ridge.

5 **STUDENT (MARIA):** At the same time, they
6 reroute the electricity around the outage, which
7 means fewer people are sitting in the dark.

8 Out on the scene, the workers locate the
9 problem and send pictures and other information
10 back to the utility office. That helps them give a
11 real-time estimate as to when the problem will be
12 fixed. And then, the utility company lets their
13 customers know what's happened and when the power
14 should come back on.

15 Our backup system for things like our fridge
16 kicked in, when my mom got a message from the
17 utility. They let us know that the lights would be
18 back on momentarily.

19 But my mom was still worried about my
20 grandmother. That's why she signed up for an
21 additional messaging service with the utility, that
22 lets her know the status of my grandmother's house,
23 as well.

24 **MOM'S VOICE (to grandmother via phone):** Hi,
25 Mom?

1 **STUDENT (MARIA):** That way, my mom can call
2 her mom and tell her when the power is coming back
3 on. That takes a big load off both their minds.

4 So, with the help of the smart grid, the
5 utility company can pinpoint where outages are,
6 respond faster, reroute power. And most
7 importantly, get the lights back on faster.

8 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

9 **MS. DENTON:** I hope that's helpful. I think
10 you can see from even the questions that are on the
11 video, those are many of the questions we're asking
12 ourselves, you know: How would all of this work?
13 How would we develop new programs and services for
14 customers? And I think, as Rob and Matt continue
15 to work through the technology piece, certainly
16 from a customer service piece, we're also
17 developing different payment options, you know,
18 what are the types of offers that this will enable
19 us to offer customers, so all of that is still
20 being worked out.

21 **MS. HEIGEL:** And that effectively concludes
22 the presentation that we wanted to give you all
23 this morning. I would want to close by thanking
24 you all for your time and the interest and
25 questions that you have shown us today. We

1 appreciate that and hope we've given you some idea
2 and sense of where we are and what we are doing.

3 We are encouraged by the Energy Independence
4 and Security Act of 2007, and are hoping that
5 federal funds will be made available to help
6 promote the deployment of smart grid technology,
7 and so we're keeping our eye on that at the federal
8 level and appropriations, accordingly. We are, as
9 you can see, excited about the possibilities that
10 the new technology does offer our business and our
11 business delivery model.

12 Again, I would just reiterate that we're not
13 here for any request today, and have appreciated
14 your time. Thank you.

15 **CHAIRMAN HAMILTON:** Thank you. Thank you,
16 very much. Do we have any final questions that
17 anyone would like to ask while we've got this group
18 together?

19 **COMMISSIONER HOWARD:** Mr. Chairman, I've got
20 one more.

21 **CHAIRMAN HAMILTON:** All right, sir.
22 Commissioner Howard?

23 **COMMISSIONER HOWARD:** What criteria do you use
24 to determine who participates in the pilot program?
25 Do you use -- I don't know -- usage of houses,

1 income, educational level? What areas do you
2 decide where to go to put in your pilot program?

3 MR. SMITH: At this point, it's been, for us,
4 our distribution system geography, more so than a
5 customer analysis. And as we've looked at the
6 different types of areas that we serve across our
7 five-state territory, we've tried to find areas
8 that we know we have in common that we'll need to
9 address. So, for instance, in the South Carolina
10 area, we're on a very rural circuit where we know
11 we have communication challenges, there are some
12 mountains and some areas that don't lend themselves
13 well to using just a pure wireless solution.

14 So at this point we have not done an analysis
15 of the type of customers that were on the circuit.
16 We actually analyze the circuit, primarily. Moving
17 forward, the way that we will do our other
18 programs, I guess, or the energy efficiency
19 programs I'm not as deeply involved with, I'm sure
20 there will be some way of screening customers for
21 that.

22 But, again, considering what we're talking
23 about today, the distribution side, the meter and
24 the distribution equipment, we're looking at our
25 system more so than the customer's.

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COMMISSIONER HOWARD: Thank you.

CHAIRMAN HAMILTON: Anything else?

[No response]

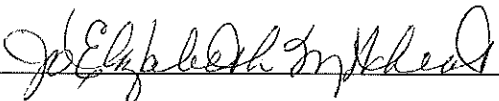
I'd like to thank each of you for being here today. It's been very informative and very timely. And we appreciate the efforts you've put forward and the time you've taken to keep us up-to-date on what's going on with Duke Energy. Thank you, very much. We stand adjourned.

[WHEREUPON, at 11:45 a.m., the proceedings in the above-entitled matter were concluded.]

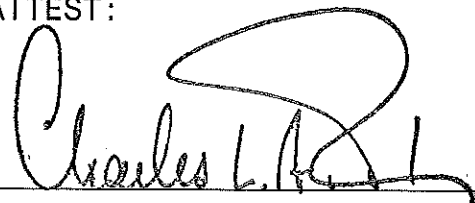
CERTIFICATE

I, Jo Elizabeth M. Wheat, CVR-CM-GNSC, do hereby certify that the foregoing is, to the best of my skill and ability, a true and correct transcript of all the proceedings had in an Allowable Ex Parte Briefing held in the above-captioned matter before the Public Service Commission of South Carolina.

Given under my hand, this the 31st day of March, 2008.


Jo Elizabeth M. Wheat, CVR-CM-GNSC

ATTEST:



Charles L. A. Terreni
CHIEF CLERK/ADMINISTRATOR

VOLUME I